

# Memorandum

Date: February 04, 2010

To: Pamela Creedon, Executive Officer  
Central Valley Regional Water  
Quality Control Board  
11020 Sun Center Drive, Suite 200  
Rancho Cordova, California 95670-6114

From: Gerald E. Johns, Deputy Director  
Department of Water Resources

Subject: Comments on Issue Paper Prepared for the Sacramento Regional County Sanitation District's National Pollutant Discharge Elimination System Permit Renewal

The Department of Water Resources (DWR) appreciates the opportunity to provide comments on the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) issue paper pertaining to the National Pollutant Discharge Elimination System Permit (NPDES) renewal process for the Sacramento Regional County Sanitation District (SRCSD) Wastewater Treatment Plant discharge to the Sacramento River. DWR's interest in providing these comments stems directly from the agency's mission to manage the water resources of California in cooperation with other agencies to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

In general, DWR believes the issue paper represents a constructive step toward better understanding the potential effects of SRCSD's discharge on the Sacramento River and the Delta. Additional information and analysis are needed, however, before affected stakeholders can thoroughly evaluate the effects of renewing SRCSD's permit or provide meaningful input on the range of permitting options presented in the issue paper. The issue paper primarily evaluates the impacts of five water quality stressors on domestic and municipal beneficial uses. It is challenging to recommend or identify the appropriate permitting option for a particular stressor in the context of a single beneficial use. For example, nutrient enrichment can adversely affect drinking water quality (as identified in the issue paper) as well as aquatic life. We therefore encourage the Central Valley Water Board staff to identify all the beneficial uses that could be affected by each stressor and evaluate potential impacts and regulatory options using a more systematic approach. Specifically, it will be important for the Central Valley Water Board to develop the knowledge base needed to thoroughly understand and evaluate potential impacts to aquatic life that could arise from an expanded discharge as proposed by SRCSD. Below are DWR's more specific comments that will hopefully assist the Central Valley Water Board staff in finalizing the issue paper:

The issue paper indicates that drinking water concerns are mostly "far field" issues that are experienced many miles downstream and throughout the Delta. However, the State Water Resources Control Board's (State Water Board) "sources of Drinking Water Policy" (Resolution 88-63), as incorporated into the Central Valley Water Board's Basin Plan, designates the entire Sacramento River as having municipal and

domestic supply beneficial uses. Additionally, the State Water Board's Statement of Policy with Respect to Maintaining High Quality Waters in California (anti-degradation policy/Resolution 68-16) requires that existing high quality waters be maintained to the maximum extent possible. These policies suggest that the Central Valley Water Board must ensure that the domestic and municipal beneficial uses are protected and that existing water quality be maintained in the Sacramento River in the immediate vicinity of SRCSD's discharge point as well as more downstream (far field) locations.

The issue paper provides water quality summary data for SRCSD's effluent and the Sacramento River above and below its discharge point (Table 1). Additional information regarding the source data used to create Table 1 is needed before stakeholders can determine if other data may be available for the Central Valley Water Board's consideration during the permitting process. The table should also disclose the period of record and number of data points used to generate minimum, median, and maximum values. It would be most useful if the raw data used to create the table were available.

Nonetheless, Table 1 does provide insight on the effects of SRCSD's discharge on the Sacramento River. It indicates that the current SRCSD discharge may already be causing nutrients in the Sacramento River to exceed levels recommended by the United States Environmental Protection Agency (USEPA) to prevent eutrophication. We note that algal blooms and aquatic plant growth already require chemical treatment and/or physical removal at certain State Water Project (SWP) facilities, including Clifton Court, trashracks along the California Aqueduct, the South Bay Aqueduct, the Coastal Branch, and Southern California reservoirs. Copper sulfate is commonly used to treat algal blooms in the SWP, but this can lead to unintended adverse effects for drinking water treatment. For example, die off of treated algae can cause taste and odor problems and filter clogging. Additionally, the cost of additional treatment is passed on to DWR and the SWP contractors. Increased nutrient discharge from the SRCSD wastewater treatment plant could exacerbate these problems. As pointed out in the issue paper, algal blooms in the SWP have already caused taste and odor concerns in Delta water supplies, which in turn suggests that there may not be additional assimilative capacity for nutrients in the system.

In addition to taste and odor problems associated with blue green algae production, the issue paper also briefly addresses the potential for SRCSD's discharge to cause increased levels of toxic microcystins. The issue paper indicates that most problems associated with these toxic algae are located in the Klamath Basin, but that they have also been known to occur in the Delta. The Central Valley Water Board staff should summarize data on the occurrence of microcystis in the Delta and further evaluate the potential link between increased ammonia levels and blue green algae production. Given that the State Water Board<sup>1</sup> has already identified toxicity associated with blue green algae blooms as a potentially serious water quality concern in the Delta, we

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<sup>1</sup> State Water Resourced Control Board Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

believe additional information on human and aquatic toxicity is needed before reasonably protective effluent limits can be established. It is our understanding that the Central Valley Regional Board will be preparing a separate issue paper addressing the potential impacts of SRCSD's discharge on aquatic life. Before proceeding with the SRCSD permitting process, it will be important for the Regional Board to thoroughly evaluate the existing literature and ongoing research pertaining to the relationship between ammonium, nitrate uptake, and the abundance and types of phytoplankton in the freshwater regions of the Delta.

Research on nutrient dynamics and primary productivity strongly suggests that relatively high ambient ammonium concentrations in coastal waters can inhibit the uptake of nitrate by phytoplankton. Dugdale et al. (2007) found that primary productivity in portions of San Francisco Bay is limited, in part, by ammonium interference with nitrate uptake by diatoms.<sup>2</sup>

Low primary productivity can adversely affect the food web and is considered to be one of the potential causes of the Pelagic Organism Decline in the Bay-Delta Estuary. In addition, elevated nitrogen to phosphorous ratios now being experienced in the Delta have also been associated with increases in blue green algae like microcystis. Blooms of this algae in the Delta have been increasing. Since microcystis can be toxic to fish, we encourage the Central Valley Regional Board to closely evaluate data and research on this issue. Nitrogen containing discharges can not only lower the diatom levels at the base of the Food Web, but also causes eutrophication issues. We look forward to commenting further on this and other related issues when the Central Valley Water Board circulates an issue paper addressing the aquatic life beneficial uses of the Delta.

It will be important for the Central Valley Water Board to carefully evaluate the potential effects of both ongoing and planned future discharges on all of the beneficial uses. To this end, it would be useful to develop projections of mass loading based on a range of proposed effluent limits and estimates of the expected water quality outcomes in the Sacramento River and the Delta.

The issue paper currently presents median and maximum constituent concentration values for historical conditions. We also recommend that water quality be evaluated under a broader range of flow conditions, perhaps seasonally or by water year type.

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<sup>2</sup> Dugdale R. C., Wilkerson F. P, Hogue V. E., Marchi A. (2007), The role of ammonium and nitrate in spring bloom development in San Francisco Bay, *Estuarine Coastal and Shelf Science*, Vol 73, 17-29.

DWR conducts extensive real-time and discrete water quality monitoring in the Sacramento River and the Delta. We also have phytoplankton and microcystis data that will be helpful to the Central Valley Water Board. We recommend that Central Valley Water Board staff consult with DWR staff to determine if additional data may be available to better inform the permitting process.

The majority of discrete monitoring data (i.e., grab sample) can be accessed through the DWR's water data library accessible from our website home page. We mention this, in part, because ammonia data collected by DWR for the Sacramento River at Hood shows significantly higher values than those presented in the issue paper for the Sacramento River at River Mile 44. We recognize that the two sites are not equivalent, but it would still be worthwhile to evaluate DWR's robust data set for comparison and validation purposes.

The section of the issue paper addressing Contaminants of Emerging Concern should include a discussion of selected nitrosamine disinfection byproducts (DBP) and their precursors, such as nitrosodimethylamine (NDMA). NDMA is a member of a chemical family known as nitrosamines which are several orders of magnitude more toxic than currently regulated DBPs. NDMA and five other nitrosamines are on the current USEPA Contaminant Candidate List and are currently being monitored by selected public water systems under USEPA's Unregulated Contaminant Monitoring Regulation 2, a process which identifies whether a contaminant has the potential to harm human health and if regulation would reduce public health risks. Over the last year and a half, water quality monitoring downstream of SRCSD's discharge has detected elevated levels of precursors associated with NDMA. Accordingly, we recommend that any renewal of SRCSD's NPDES permit include provisions to require monitoring for the 6 listed nitrosamines and the WWTP products associated with their formation (e.g., chloramines,  $\text{NH}_3$ , dissolved organic nitrogen, and chlorine).

In summary, DWR appreciates that the Central Valley Water Board is faced with significant technical uncertainty in the permitting process. However, SRCSD is proposing to increase the volume of its discharge by up to 55 percent as compared to current average discharge conditions. Existing levels of discharges may already be causing drinking water and biological concerns in the Estuary. An increase in mass loading from the SRCSD treatment plant has the potential to further adversely affect the beneficial uses of the Sacramento River and the Delta. There is growing evidence to support a decrease in nitrogen loading to better protect beneficial uses. The Central Valley Water Board needs to consider this ongoing research. Information contained in the issue paper should therefore be augmented by additional study and/or research before permitting options are selected. Where uncertainty persists, the Central Valley Water Board should require monitoring and/or special studies coupled with re-opener provisions that would trigger control actions if water quality impairment is identified at a later time.

DWR appreciates the Central Valley Water Board staff efforts in preparing the issue paper and we hope our comments assist with refinement of the paper. Please feel free to contact me at (916) 653-8045 if you have any questions regarding these comments. Questions regarding DWR's water quality data should be directed to Eric Oppenheimer at (916) 376-9715.

Sincerely,

A handwritten signature in cursive script, reading "Gerald E. Johns".

Gerald E. Johns, Deputy Director  
Department of Water Resources

cc: Ms. Kathy Harder  
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